Gemini Series PFD

Installation/User Manual
8300-083

Rev D

Table of Contents

Table of Contents 2

Document Revision Level & Notes 4

Instrument Installation 5

- Mounting Considerations 5
- Wiring Considerations 5
- Pitot and Static Connections 5
- RFI/EMI Considerations 6

Getting Acquainted With Your Gemini PFD 7

- Gemini PFD Display 7
- Using the Touch Screen 8
- Info Page Display 9

Gemini Series PFD Setup 10

- GPS Signal Acquisition 10
- Slip Indicator Centering 11
- Setting ASI V-Speeds 12
- Setting Speed Units 13
- Setting Altimeter Units 14
- Setting Barometer Units 15
- Low Airspeed Warning Setting 16

Flying with Your Gemini PFD 17

Adjusting Barometer Setting **17**
Loss of Airspeed **18**
Setting DG If GPS Signal Is Lost **19**
Electrical Pin-out **20**
Gemini PFD Wiring Diagram **21**
Warranty On TruTrak Flight Systems Products **22**
Return Merchandise Policy And Procedure **24**

Document Revision Level & Notes

Revision	Date	Description	Page #
A	6/1/2012	Initial Release	
B	6/22/2012	Corrected dimmer voltage	17
C	7/13/2012	Added Units setups and adjusted layout	All
D	11/5/2012	Updated for software 2.0, added GPS backup for airspeed loss	18

Instrument Installation

Mounting Considerations

The Gemini PFD unit is designed to mount in the aircraft instrument panel. Maximum recommended viewing angle should be no more than 20 deg. The maximum mounting angle the instrument can accommodate is 10 degrees longitudinal axis and 0 degrees lateral axis. The primary unit location should minimize pilot head movement when transitioning between looking outside of the cockpit and viewing/operating the instrument. The location should be such that the instrument is not blocked by the glare shield on top, or by the throttles, control yoke, etc. on the bottom. Use aircraft installation standards for mounting and support of the instrument.

Wiring Considerations

Use AWG #24 or larger wire for all connections unless otherwise specified. The standard solder pin contacts supplied in the connector kit are compatible with up to AWG #18 wire. In cases where some installations have more than one component sharing a common circuit breaker, sizing and wire gauge is based on length of wiring and current draw on units. In these cases, a larger gauge wire such as AWG #20 may be needed for power connections. Do not attach any wires to the outside of the instrument or route high current wires within six (6) inches of the programmer. Ensure that routing of the wiring is not exposed to sources of heat, RF or EM interference. Check that there is ample space for the cabling and mating connectors. Avoid sharp bends in cabling and routing near aircraft control cables. Do not route the COM antenna coax near any instrument components. The Gemini should be connected to the avionics master bus, not the battery master bus. This way the instrument is in a powered down state during engine starting.

Pitot and Static Connections

The preferred method of connecting the static line is a tee fitting near the aircraft's altimeter. The static line requires due care in its installation as excessive lag or insufficient static orifices can cause discrepancies in instrument information. The importance of a good static port and line cannot be overstated. In some cases problems can be caused by having a large number of devices connected to a single, insufficient, static port. In other cases, the static line itself is adequate but there are one or more devices connected to the

same line, one of which has a large static reservoir. A simple remedy for this problem if it occurs is a tee-fitting near the static port, and a dedicated line to the instrument. Obviously, an insufficiently-large orifice coupled with large static reservoirs can aggravate the problems associated with lag. **The pitot line MUST be connected to the Gemini PFD for proper operation.**

RFI/EMI Considerations

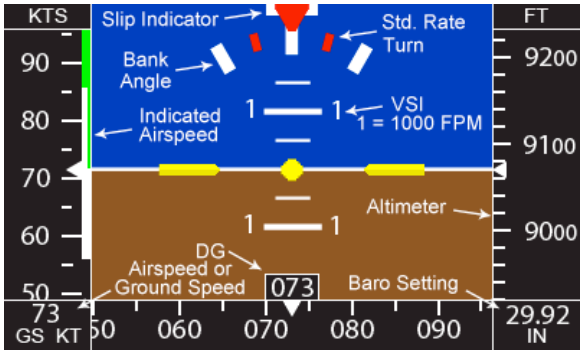
The instrument is shielded and does not generate any appreciable level of electromagnetic interference. It has a low-current draw and cannot contribute to RF interference. The solid-state gyros used in the instrument are susceptible to outside stray RFI. Be sure all COM antennas are properly installed, tuned, and grounded as stray RFI can cause unreliable attitude information.

Getting Acquainted With Your Gemini PFD

Gemini PFD Display

The diagram at right illustrates some of the features of the Gemini PFD display.

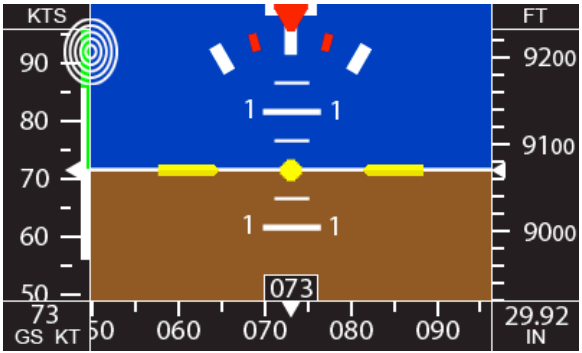
The pitch display of the Gemini PFD is velocity vector. This is not pitch attitude but rather the flight path of the aircraft. Changes in pitch attitude will be registered and displayed with gyroscopic information. Over the long term the pitch scale displays the vertical speed of the aircraft. This creates a simple to use instrument for maintaining altitude. As long as the reference plane is on the horizon line, the aircraft is maintaining altitude; regardless of power setting or pitch attitude.



Using the Touch Screen

The Gemini PFD has a touch screen interface. It is a capacitive touch display and therefore does not require very much pressure on the display to operate. There are several functions of the touch screen with the Gemini PFD; centering the slip indicator, the Low Airspeed warning, displaying the Info page, setting the ASI V-speeds, adjusting the altimeter baro setting, and setting the DG when GPS signal is lost.

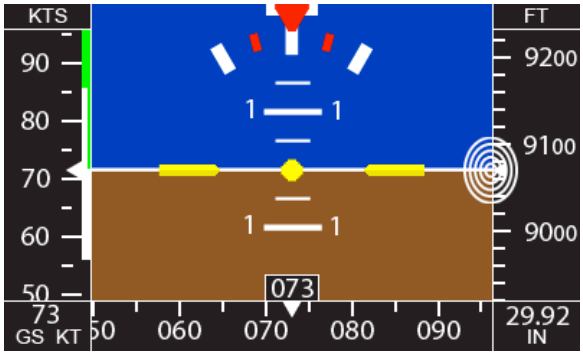
The upper left corner of the display will act as a 'control key' for some of these functions. ***The 'bulls-eye' indicates the location to touch, but does not actually appear on the screen.**



Info Page Display

The unit serial number and software revision level can be displayed by touching the right-center area of the display, shown below.

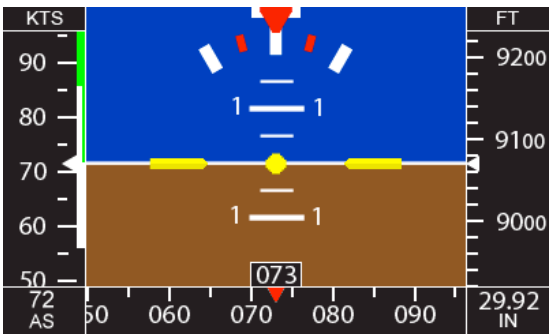
1-Touch and hold the right-center area to display the info page. The instrument will return to normal flight screen when the screen is released.



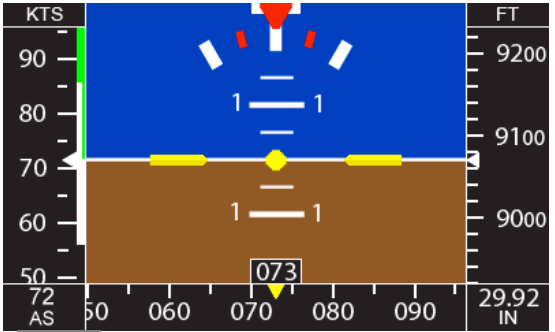
Gemini Series PFD Setup

GPS Signal Acquisition

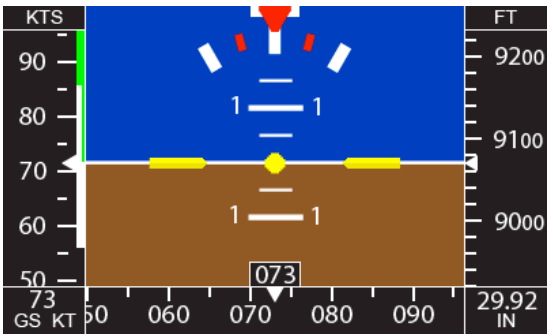
The Gemini Series PFD has some required setup before the first flight. Ensure that the instrument is powered down until after the engine is running. Once the engine is running and with the aircraft still stationary, apply power to the Gemini. The DG pointer has different colors to show GPS signal status:



Red=No GPS signal detected



Yellow=GPS signal detected, but no GPS fix



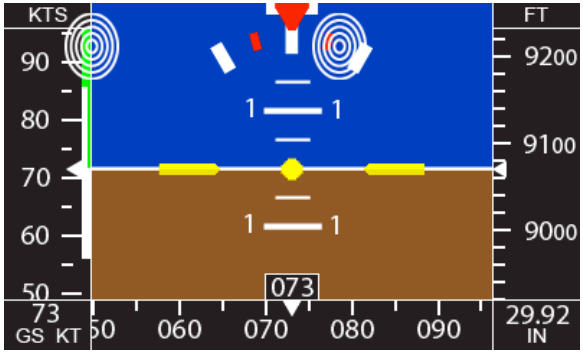
White=GPS signal detected and good GPS fix

Slip Indicator Centering

It is best to center the slip indicator while the aircraft is on the ground and stationary. To center:

1-Touch and hold ‘control key’ in upper left corner of display.

2-While holding ‘control key’, touch just to the right of the slip pointer.



Setting ASI V-Speeds

The Gemini PFD has adjustable color bands on the airspeed indicator to represent: V_{s0}, V_s, V_{fe}, V_{n0} and V_{ne}. These settings are accessed through a menu on the display. This procedure will only need to be performed one time, before the first flight.

1-The menu is accessed by touching all three of the buttons on the left side of the display. (Figure 1a)

2-Once the menu is shown; the first setting is for V_{s0}. The upper left key increases the start value for the currently selected setting. The lower left key decreases the start value. Notice the color band changes on the ASI with adjustment of the value. (Figure 2a)

3-To advance to the next setting touch the lower right key. (Figure 3a)

4-Repeat steps 1-3 for each of the V-speed settings.

Once the V-speeds have been set, the next setup screen is the setting of the ASI units. This will be described on the following page:

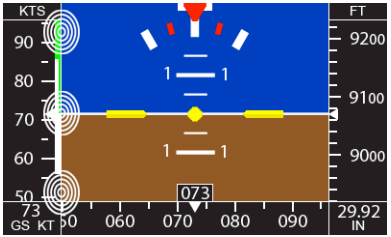


Figure 1a

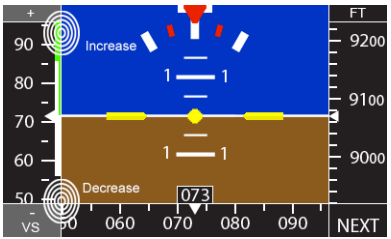


Figure 2a

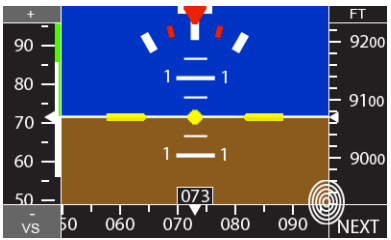


Figure 3a

Setting Speed Units

The Gemini PFD has adjustable units for the airspeed indicator and the ground speed indicator. These setting are accessed though the same menu used to setup the V-Speeds. The selectable units for speed are Knots (KTS), Kilometers per hour (KPH), and Miles per hour (MPH).

1-If the PFD is still in the V-speed setup mode, advance to step **2** If not, the menu is accessed by touching all three of the buttons on the left side of the display. (Figure 1b)

2-Advance to the Speed units setup screen by touching the lower right key (Figure 2b). The lower left will show AS when you reach the Speed units setup screen.

3-Select the desired Speed units using the + and – (Figure 3b)

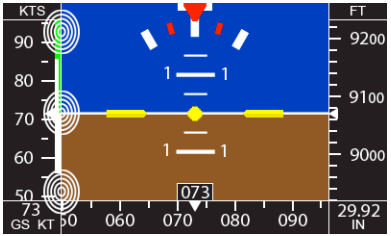


Figure 1b

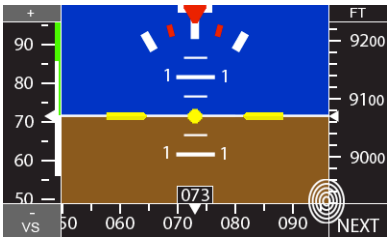


Figure 2b

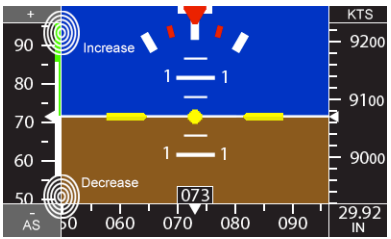


Figure 3b

Setting Altimeter Units

The Gemini PFD has adjustable units for the altimeter. These setting are accessed though the same menu used to setup the V-Speeds and Speed units. The selectable units for the altimeter are Feet (FT), and Meters (M).

1-If the PFD is still in the Speed units setup mode, advance to step **2** If not, the menu is accessed by touching all three of the buttons on the left side of the display. (Figure 1b)

2-Advance to the Altimeter units setup screen by touching the lower right key (Figure 2b). The lower left will show ALT when you reach the Altimeter units setup screen.

3-Select the desired Altimeter units using the + and – (Figure 3b)

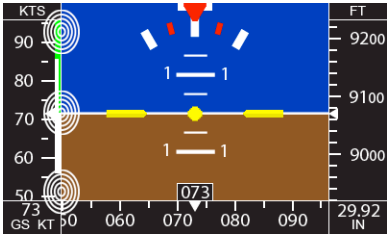


Figure 1b

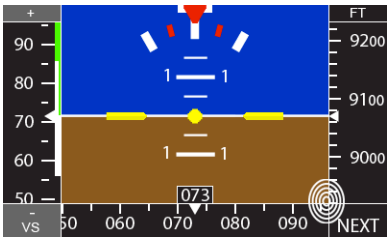


Figure 2b

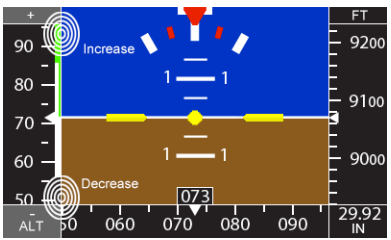


Figure 3

Setting Barometer Units

The Gemini PFD has adjustable units for the barometer. These setting are accessed though the same menu used to setup the V-Speeds, Speed units, and Altitude units. The selectable units for barometer are Inches Mercury (IN HG), Hectopascal (HPA), Millibar (MBAR), and Millimeters Mercury (MMHG).

1-If the PFD is still in the Barometer units setup mode, advance to step **2** If not, the menu is accessed by touching all three of the buttons on the left side of the display. (Figure 1b)

2-Advance to the Altitude units setup screen by touching the lower right key (Figure 2b). The lower left will show BARO when you reach the Barometer units setup screen.

3-Select the desired Barometer units using the + and – (Figure 3b)

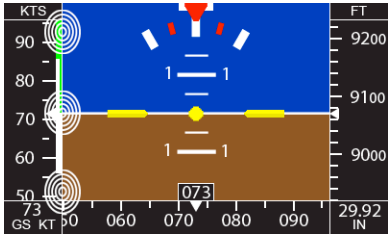


Figure 1b

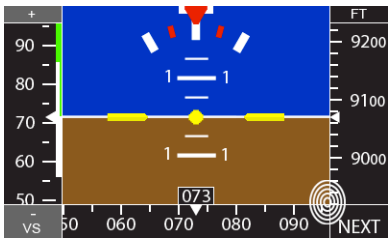


Figure 2b

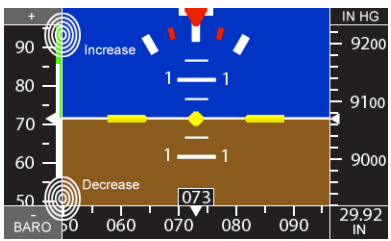


Figure 3

Low Airspeed Warning Setting

This operation must be performed in flight. The pitot line must be connected to the instrument. To set LAS warning:

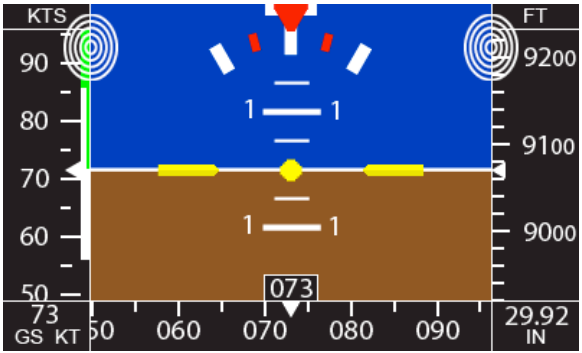
1-Fly at the desired indicated airspeed for the low airspeed warning setting.

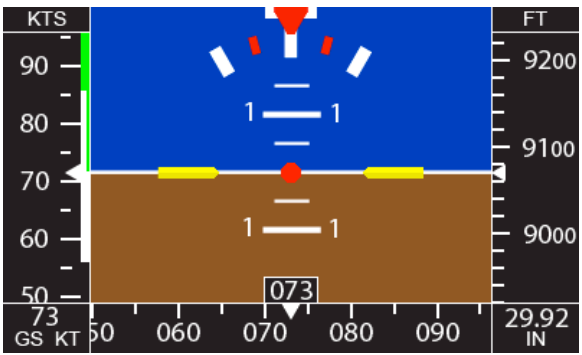
2-Touch and hold 'control key' in upper left corner of display.

3-While holding 'control key', touch the upper right corner of the display.

4-The center dot of the reference airplane will flash confirming that the LAS warning has been set.

Once a value has been set for the LAS warning the dot of the reference airplane will be solid red when IAS is ½ or less of the set value. It will flash when the IAS is ½ or greater of the set value and will continue flashing until the IAS is above the LAS warning setting. At that point it will turn back to yellow.





Red dot showing IAS less than ½ of set LAS

Adjusting Barometer Setting

The Gemini PFD has a built-in altimeter therefore it will be necessary to adjust the barometer setting.

1-Touch the lower right key to access the barometer adjust menu. (Figure 1b)

2-Once the menu is shown the upper left key increases the value by 0.01 in Hg. The lower left key decreases the value by 0.01 in Hg. (Figure 2b)

After five seconds the setup screen will deactivate and the settings will be saved. If no adjustment is made, the setup screen will deactivate in 10 seconds.

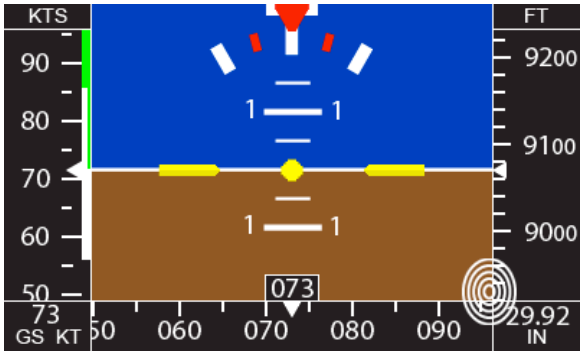


Figure 1b

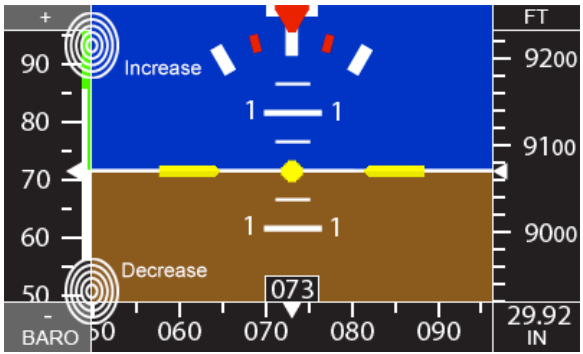
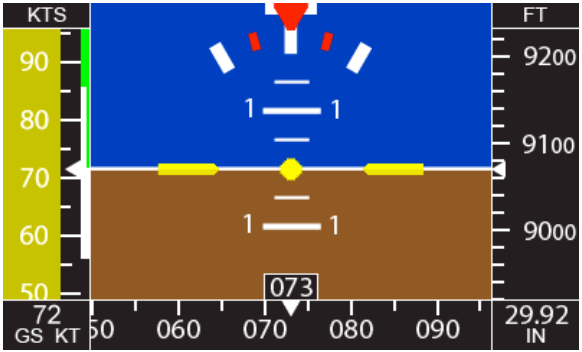


Figure 2

Loss of Airspeed

If the Gemini loses airspeed, or is not connected to a Pitot system the airspeed tape will become a ground speed tape. This will only occur if the ground speed is greater than V_{s0} (Bottom of the white arc). The background color of the tape will change to yellow to indicate that it is not displaying airspeed, but is in backup mode displaying ground speed.

(note: Even if not connecting to the Pitot / Static system, both ports MUST be open to the cockpit.)



AS tape displaying ground speed

Setting DG If GPS Signal Is Lost

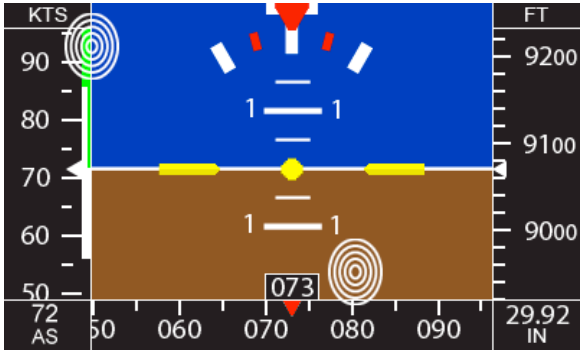
If the GPS signal is lost the DG will enter the free gyro mode. This mode has no track or heading reference so the DG must be set against a compass heading or other directional reference. There are several options for changing the DG direction.

1-To stop the DG from drifting left, press and hold the 'control key' and to the right of the DG box. The longer these keys are held the more the drift will be reduced.

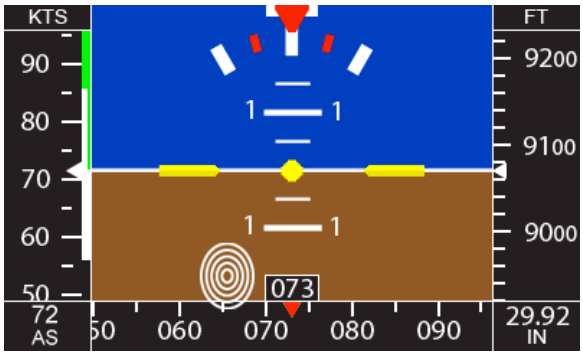
2-To stop the DG from drifting right, follow the same procedure as in **1**, but touch to the left of the DG box.

Once the drift has been removed (DG stopped), the following procedure can be used to set the DG value.

1-Hold the key on the side of the DG box that corresponds to the desired DG direction. The longer it is held, the faster the DG will move. Release the key when the desired value is displayed in the box.

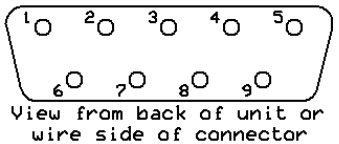


Removing drift to the left



Moving the DG to the left

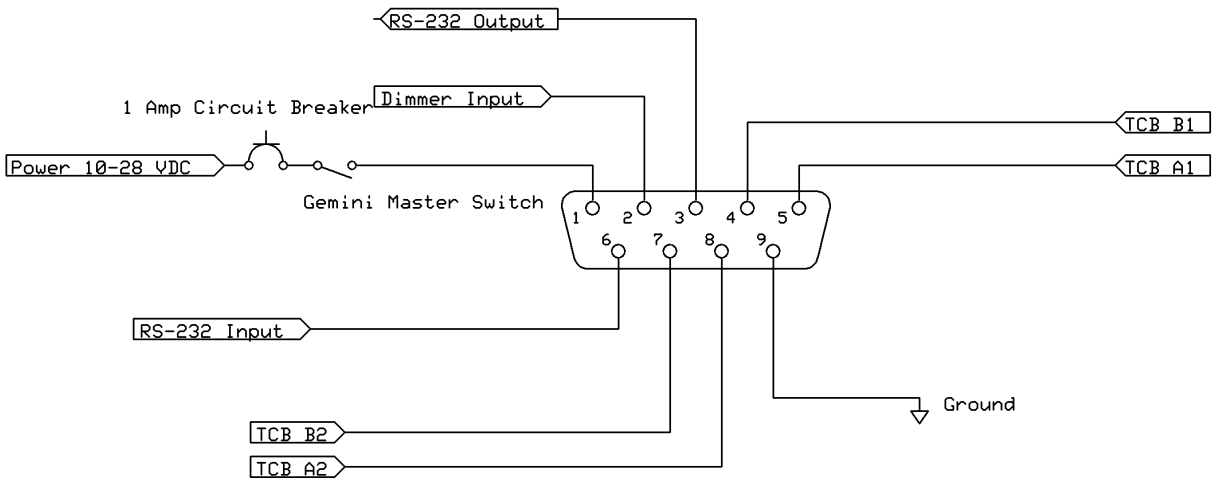
Electrical Pin-out



Rear 9-Pin Connector P101
viewed from rear of unit

P101 Pin	Function	Notes
1	**Aircraft Power** (8-30 VDC)	0.2 A @ 12 V, 0.11 A @ 24 V
2	**Dimmer Control***dimmer and aircraft power voltage must match	Variable voltage input, 0-30 Volts
3	**RS-232 Output**	Internally connected to pin 6
4	**TCB-B_1**	Must be an unshielded, twisted pair. Only used for interface to other TTFS products.
5	**TCB-A_1**	
6	**RS-232 Input from GPS** (NMEA 0183 or Aviation format is accepted at baud rates of 4800 or 9600)	
7	**TCB-B_2**	Must be an unshielded, twisted pair. Only used for interface to other TTFS products.
8	**TCB-A_2**	
9	**Ground Connection**	

Gemini PFD Wiring Diagram



Warranty On TruTrak Flight Systems Products

We at TruTrak Flight Systems know how important it is to feel as though the customer is purchasing a product that the manufacturer is going to stand behind. For this reason we want offer more than the basic one-year warranty that is standard to this industry. The warranty on all TruTrak products will be three years from the date of purchase. Abuse and misuse of a product are not covered under this warranty. Modification to a product may void the warranty, as well as carry a penalty when upgrading to another product. This three-year warranty will be for all products except the Pictorial Turn & Bank, which will continue to have a warranty of one year from the date of purchase.

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Return Merchandise Policy And Procedure

Under no circumstances should products be returned to TruTrak without first obtaining a Return of Merchandise Authorization number (RMA #) from TruTrak. An RMA# may be obtained by contacting us at 866-878-8725.

Products that do not have an RMA # will not be processed.

Please include documentation stating the reason for the return and describing any symptoms, failure modes, suspected causes of damage, diagnostics performed, data collected, etc.

Product(s) should be packaged in their original shipping containers. In lieu of this, they should be very carefully packaged in containers suitable to protect them during transit. For your protection, items should be insured for the full value. Note that damage caused during shipping will not be repaired under warranty.

The outside of the box must be clearly marked with the RMA # issued by TruTrak and the RMA # must also be noted on the return documents.

Products will be returned to the customer at no charge via FedEx Ground or UPS Ground. If customer requests expedited shipping (2nd Day or Overnight) they will be charged the shipping cost and must supply a credit card number.

INTERNATIONAL SHIPMENTS:

TruTrak sends all International shipments with an insurance value on all products. The customer is responsible for any and all fees, including the cost of shipment, duties, and taxes associated with the shipment.

When sending products to TruTrak for repair or otherwise please be advised that the customer is responsible for all charges and fees associated with shipment. For your protection, items should be insured for the full value.

TruTrak states on all product returns "WARRANTY REPAIR AT NO CHARGE TO CUSTOMER. A COMMERCIAL INVOICE VALUE OF $___ GIVEN FOR INSURANCE PURPOSES ONLY"

Please keep in mind that your government or another entity in your country may impose a charge for custom and/or brokerage fees, duties and taxes on items received from the US. These charges do not originate from our company nor do we benefit from them in any way. You are responsible for payment of all custom and brokerage fees, duties and taxes that may be imposed when these goods are imported into your country.

Send UPS/FedEx/DHL return shipments to:

TruTrak Flight Systems, Inc., 1500 South Old Missouri Road, Springdale, AR 72764 USA
Attention: Returns Dept. RMA# _____

TRUTRAK FLIGHT SYSTEMS

1500 S. Old Missouri Road

Springdale, AR 72764

POSTAL SERVICE ADDRESS

P.O. Box 189
Springdale, AR 72765-0189

Ph: 479-751-0250 Fax: 479-751-3397

Toll free: 866-TRUTRAK

866-(878-8725)

www.trutrakap.com